

Remarks

Please consider the following remarks.

Support for the amendments to claims 1, 11 and 17 can be found in originally filed claims 3 and 4 for amended claim 1, originally filed claims 12 and 15 for amended claim 11 and originally filed claims 18 and 21 for amended claim 17. Claim 2 has been amended for clarification purposes.

The Examiner has rejected claims 1 and 11 under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bannon (4,490,215) or Molique (3,230,158).

Bannon discloses a fractionation column **2** wherein liquid from a bottom tray **4** passes via a downcomer means **5** and liquid seal pan **17** into a liquid compartment **6** which is then carried to a reboiler **3** via a conduit **7**. Reboiler **3** vaporizes at least a portion of the liquid and the at least partially vaporized liquid is returned to column **2** via a conduit **8**. A baffle means **10** is disposed under conduit **8** to carry the liquid from conduit **8** to a second liquid compartment **11** which is normally liquid full. Liquid compartment **6** and second liquid compartment **11** are connected in fluid flow communication by communication means **13**. As shown in FIG. 1, the vapor from conduit **8** is in fluid flow communication with downcomer means **5**. See Col. 3, line 31 to Col. 4, line 7 and FIG. 1 of Bannon.

Molique discloses a fractionator tower **2** from which a portion of the bottoms is taken by a conduit **4** to bottom header **5** of fired heater **6** containing tubes **7**. The liquid entering header **5** subdivides and passes through tubes **7** and the heated fluid which has risen through tubes **7** is collected in header **8** and passed by a conduit **9** back to fractionator tower bottoms just above the level of liquid therein. Flashed vapors rise, as shown by the arrow in FIG. 1, while unvaporized or residual liquid falls to the bottom. Liquid **10** from a bottom tray **11** is passed by a downcomer **12** and a pipe **13** to header **5** for admixture in header **5** with the bottoms liquid entering by pipe **4**. FIG. I shows that the downcomer **12** extends a considerable distance above the top surface of bottom tray **11** such that the liquid level on bottom tray **11** extends above the top of the vapor passageway devices of bottom tray **11**. See Col. 2, line 65 to Col. 3, line 15, and FIG. 1.

Applicant submits that claims 1 and 11, as amended, and each of claims 2, 5-10, 13, 14 and 16 which depend variously from claims 1 and 11, are patentably distinguishable over Bannon and Molique.

Claim 1

Claim 1, as amended, includes the limitation “wherein said at least one downcomer and said first conduit are substantially sealed off from fluid flow communication with said vapor delivery means” which makes claim 1, as

amended, distinguishable over Bannon. As shown in FIG. 1 of Bannon, conduit 8 (a vapor delivery means) is not sealed off from fluid flow communication with either the downcomer means 5 (the downcomer) or the conduit 7 (the first conduit), and in fact is clearly in fluid flow communication with such elements. Thus, claim 1, as amended, clearly distinguishes over the Bannon reference.

Claim 1, as amended, also includes the limitation “wherein said bottom tray is further characterized to include a top surface and at least one downcomer extending downwardly from said top surface for removal of said accumulated liquid from said bottom tray” which distinguishes claim 1, as amended, from the Molique reference. FIG. 1 of Molique discloses a downcomer 12 which extends to a height well above the top surface of its bottom tray 11. Thus, claim 1, as amended distinguishes over the Molique reference in that the downcomer of the Molique reference extends above the top surface of its bottom tray instead of extending downwardly from the top surface, as is required in claim 1, as amended.

Claim 11

Claim 11, as amended, includes the limitation “wherein said overflow liquid stream is substantially sealed off from fluid flow communication with said vapor introduced into said separator” which distinguishes claim 11, as amended, from the Bannon reference. As stated above, as shown in FIG. 1 of Bannon,

conduit 8 (a vapor delivery means) is not sealed off from fluid flow communication with either the downcomer means 5 (the downcomer) or the conduit 7 (the first conduit), and in fact is clearly in fluid flow communication with such elements. Thus, claim 11, as amended, distinguishes over the Bannon reference.

Claim 11, as amended, also includes the limitation “wherein substantially all of said liquid overflowing from said bottom tray is collected in said at least one downcomer” which distinguishes claim 11, as amended, from the Molique reference. With the downcomer configuration discussed above for the Molique reference, the liquid level on the bottom tray 11 of Molique will be such that liquid will pass from bottom tray 11 into a flashed vapor/liquid zone to which vapor and liquid are also passed from conduit 9. Therefore, a substantial portion of the liquid is passed to the flashed vapor/liquid zone feeding conduits 3 and 4. In light of this, it is not possible for the Molique reference to meet the limitation in claim 11, as amended, that substantially all of the liquid overflowing from said bottom tray is collected in said at least one downcomer. Thus, claim 11, as amended, distinguishes over the Molique reference.

The Examiner has rejected claims 2-10 and 121 (12?) – 24 under 35 U.S.C. 103(a) as being unpatentable over Bannon or Molique in view of Kraft (2,534,173).

Kraft, in Fig. 3, discloses a distillation column **10** which includes a lower tray **14**, a collection trough **16** extending across the tray **14** and a downcomer **17** extending downwardly from trough **16** to a draw-off pipe **21** which is spaced from the downcomer **17**. The liquid from downcomer **17** is passed via draw-off **21** to a reboiler **22**. A vapor liquid mixture is discharged from reboiler **22** through line **26** into the bottom of the column **10** below the first tray (plate) **14**. As can be seen from the depiction in Fig. 3, the vapor from line **26** is in fluid flow communication with liquid feeding draw-off pipe **21**.

Applicant points out, as stated above, that the downcomer and first conduit are substantially sealed off from fluid flow communication with the vapor delivery means in amended claim 1, and, with regard to amended claim 11, that the overflow liquid stream is substantially sealed off from fluid flow communication with the vapor introduced into the separator. Due to these limitations in amended claims 1 and 11, respectively, Applicant submits that amended claims 1 and 11 and the claims which depend variously therefrom, are patentably distinguishable over Bannon and Molique and that the Kraft reference does not supply the above described elements not present in either Bannon or Molique.

Regarding the rejection of claims 17 – 24, Applicant points out that claim 17, as amended, includes the limitation that “said overflow liquid stream is

substantially sealed off from fluid flow communication with said vapor passed from said reboiler means to said separator”, which distinguishes claim 17 over the Bannon, Molique and Kraft references, either alone or in combination. As stated above, regarding the Kraft reference, the vapor from line **26** is in fluid flow communication with liquid feeding draw-off pipe **21**, which does not meet the above described limitation in amended claim 17. Thus, Applicant submits that amended claim 17, and all the claims which depend variously therefrom, are patentably distinguishable over Bannon and Molique and that the Kraft reference does not supply the above described elements not present in either Bannon or Molique.

In view of the amendments to claims 1, 2, 11 and 17, the cancellation of claims 3, 4, 12, 15, 18, and 21, and the remarks above, claims 1, 2, 5 – 11, 13, 14, 16, 17, 19, 20, and 22 – 24, are now believed to be in condition for allowance. Therefore, early allowance for each of claims 1, 2, 5 – 11, 13, 14, 16, 17, 19, 20, and 22 – 24 is respectfully requested.

Respectfully submitted

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